Sample of Students' response

After the demonstration of "Mission Elektron", the following survey was conducted. A sample of their responses (bulleted items are students' response; edited for clarity) is included in this document.

Q. 1 What is nano-science?

- Science at 10^{-9}m or smaller scale.
- Science at the nanometer scale.
- Science at the nanometer or smaller scale.
- The study of systems whose dimension is of the order of nano (10^{-9}) meters or smaller than that.
- Understanding systems at the atomic or molecular level.
- The science of systems at the nano-scale.
- Nano-science is a study of systems at the sub-nano level. It includes the study of atoms and molecules.
- Science on the very small (nanometer, sub-nanometer) scale.
- Designing ways of making things at the scale of 10^{-9} meters.
- Science on the 10^{-9}m or even smaller scale.
- The study of particles and molecules on the nano and sub-nano levels.
- Science under the 10^{-9}m scale. So, very small.
- The science at the nanometer or below, scale.
- Science at a very small scale of 10^{-9}m.
- Study of systems which are 10^{-9}m or smaller.
- Science at the nanometer level.
- The study of materials on the 10^{-9}m scale.
- Science on the scale of 10^{-9}m.
- Science on the nanoscale (nano-meters).

Q.2 Which law dictates the current growth of semiconductor industry?

- Moore’s law – Every 18months the size of switch will be halved.
- Moore’s law.
- Moore’s law.
- Moore’s law: Every 18months, electronic device size is reduced to half of its original.
- Moore’s law.
- Moore’s law-Size of transistor is reduced to its half every 18months.
- Moore’s law-Every 18months the transistor’s size is reduced by half.
- Moore’s law.
- Moore’s law.
- Moore’s law.
- Moore’s law-Every 18months, transistor’s size decrease by a factor of 2.
- Moore’s law-Every 18months processor’s size are reduced to its half.
- Moore’s law
- Moore’s law
- Moore’s law
- Moore’s law
- Moore’s law
- Moore’s law-Every 18months, transistor size halves.

Q.3 What did you learn from the animation “Mission Elektron”?

- One can’t use classical mechanics to describe the switch problem.
- How a resistor works.
- I have never heard of using molecules in circuit boards and that such small systems are ruled by quantum mechanics.
- You can use nanotechnology to create a smaller circuit.
- I learned how beneficial it is to make smaller and smaller transistors.
- That there is a molecule that is able to do what we need it to do.
- Molecules can be used as a switch. A parallel processor supercomputer works like the human brain – it has the ability to receive, transmit, and process many different types of information at the same time.
- Certain molecular structures can be made to act like switches.
- When leads are far apart an electron requires more energy to traverse the gap.
- Learned about quantum gates. Also, molecular transistors are going to replace traditional Si transistors.
- Energy is needed to cross the gap to complete the circuit. The switch can be opened to break the circuit.
- The potential of molecular transistors.
- The basic idea behind the molecular transistor. I knew of research in this area but not how a switch could function.
- Use of a molecule as a replacement for the transistor.
- Molecular transistors are faster.
- How transistors work. Why molecular switches are important.
- Molecules can be used as transistors.
- Benzene rings can be used in transistors.
- The transistor can be made from a flexible molecule.

Q.4 What would be the advantage if we can build “transistor or switch” from ultra-small molecules?

- Then we can bypass the miniaturization limit. And we can make computers out of smaller and faster components.
- You could make smaller and faster processors.
- Moore’s law will continue to be accurate. We can make super small computing devices.
- You can make much more densely packed circuits.
- You can put many more transistors in a smaller area. Therefore machines can be made of powerful, while still getting smaller.
- We would be able to create incredibly powerful computers.
- Computers can be made much more powerful and smaller.
- We can have much more in a small space which would make computation faster.
- We could have ultra small appliances that would be very fast and would require less energy to use.
- You could fit more in the same amount of space.
- We could put more transistors in the same space making computers and mobile technology not only faster but more reliable.
- You could have a supercomputer of the size of laptop.
- One could make more densely packed processors for smaller and more efficient computers.
- You could fit more transistors in a chip and therefore increasing the power of the processor.
- Much faster computers.
- You can put a whole bunch on a smaller area. More number of transistors results in a more powerful processor.
- A lot more computing power.
- We have more computing power in the same space.
- We could make extremely small and efficient computers.

Q.5 How would this field of “nano-science” in general be useful to the society?

- It will make things much smaller. So you can fit more in the space. So, it will make them more potent. Also because molecules are everywhere, the resource will be unlimited.
- It is making technology faster and smaller.
- Super small storage of huge amounts of data, amazingly fast computers. Basically anything that normally would be thought of as sci-fi could potentially work.
- By enabling us to build smaller and faster electronic circuits.
- It would make faster and smaller electronic circuits available to the public.
- More complex hand held devices better computing power – i.e games would be able to get even more complex.
- Advancement in computer technology not just for scientific research, but for personal use. A more powerful computer allows for a faster processing of information.
- We can make computer smaller and faster. Essentially computing would be faster.
- Improving data processing in an effort to speed up research.
- It would revolutionize computers on a massive scale. The application of computer could be limit-less.
- Faster, smaller and more reliable technology. Medical advances are also possible. Making smaller transistors can also lead to making everything else smaller and better.
- Faster, smarter computer for both social and economic development. They would provide help to any field of interest.
- More powerful computers given to everyone. Modeling extremely complex problems requiring entire room full of computers could be done on machine the size of a laptop.
- Faster computers allow better, faster, and more accurate simulations of the world around us. A better understanding of the world gives us the ability to devise new and inventive technologies.
- Smaller faster processors for everyday use and much more energy efficient switches.
- Unique transistor control. Molecules are plentiful. Densely packed circuits allow a lot to happen at once.
- The smarter a computer the more useful it becomes. Almost all society would benefit right from guided missiles to household appliances – all of which govern themselves.
- Better processors mean that robots will take over the world even faster.
- We could build things smaller, faster, and more efficient.